

**ExxonMobil Environmental
And Property Solutions**

Park & Brunswick Avenue
Building 7 – Site Remediation
Linden, New Jersey 07036
703.963.7132 Telephone

Maureen P. Forlenza
Bayway Team Lead Project Manager



Date: August 26, 2020

Mr. Charles Zielinski
New Jersey Department of Environmental Protection
Bureau of Case Management
P.O. Box 420
Trenton, New Jersey 08625-0420

**RE: Response to NJDEP Comments
Aquatic Ecological Risk Assessment Data Summary Report
Bayway Refinery – IAOC E1
1400 Park Ave.
Linden, Union County, NJ
SRP PI# 008282**

Dear Mr. Zielinski:

The IAOC E1 Aquatic Ecological Risk Assessment (ERA) Data Summary Report was submitted to the New Jersey Department of Environmental Protection (NJDEP) on August 27, 2019 for the Bayway Refinery Complex in Linden, NJ. A formal comment letter from the NJDEP was received January 28, 2020. ExxonMobil Environmental and Property Solutions (ExxonMobil) offers the following responses to your comment letter (responses included after each comment).

Comment 1:

The samples were collected from 0-6 inches and the results indicated that several contaminants are above the ESC. The site needs to be fully vertically and horizontally delineated in accordance with N.J.A.C.7:26E-4.8 (c). This was discussed during the October 2nd, 2019 meeting. A letter was received on October 25th, 2019 expressing the full delineation was not necessary, citing the EETG Section 5.3.3.1. It omitted to cite the remainder of the paragraph of Section 5.3.3.1, which states: "If contaminants are found above the ESC, then delineation must be performed in accordance with N.J.A.C.7:26E-4.8 (c) 1." Additionally, the Technical Requirements for Site Remediation citation N.J.A.C. 7:26E-4.8 (c)1 states:

"Delineate the horizontal and vertical extent of the contaminant concentrations in the contaminant migration pathway or environmentally sensitive natural resource to any applicable ecological screening criterion and aquatic surface water quality standard."

The Department understands the information provided was collected for the purpose of the ERA for IAOC E1, but regardless of the remedial action, the site must be vertically and horizontally delineated to background levels or ESC to fully characterize the site's current condition. Site specific background levels can be established and used if greater than the ESC. The delineation can be completed by the next deliverable. The ERA will only address areas of potential receptor exposure.

Response 1.

As discussed in our February 18, 2020 Technical Consultation Meeting, vertical delineation will be conducted at the same locations previously sampled in both ponds and analyzed for the same parameters. The timing of the sampling may depend on what risk management decisions are agreed upon with NJDEP BEERA for each pond.

Specifically, ExxonMobil will conduct vertical delineation sampling in both the IAOC E1 Northern Pond and the IAOC E1 Southeast Pond. The existing sample locations will be sampled at a 2-foot depth below the sediment surface to reflect the lower extent of sediment, since the ponds are shallow. The data will be provided in tables as an Appendix to the ERAR but will not be used as part of the hazard quotient modeling to assess ecological risks, since biota would not be exposure to sediments at that depth.

The existing horizontal delineation of both ponds is already adequate for assessment of ecological risks from surficial sediments. The Northern Pond is a little over an acre in extent and the Southeastern Pond is about a third of an acre. So horizontal delineation is bounded by the respective shorelines of the ponds. This phased approach is consistent with what was discussed in the October 2018 technical consultation meeting, (as reflected in the meeting summary), to which the Department initially agreed.

Comment 2:

Table 5-2 shows an elevated level of EPH (15,000 ppm) at SED-E24, collected on November 20th, 2018, based on the analytical data for the sample collected at 0-6 inches. EPH shall be horizontally and vertically delineated (NJAC 7:26E-3.6(b) and NJAC 7:26E-4.8). The delineation will determine the need for remedial action, pursuant to NJAC 7:26E-5.1(e).

Response 2:

The extent of any EPH contamination vertically would be evaluated from the vertical sediment samples described above. For the record, however, the Department has used the word "elevated", but it is unclear in reference to what: there are no standards or criteria for EPH in sediment. Should product be encountered in any samples it would be managed as such under the Technical Requirements for Site Remediation (N.J.A.C. 7:26E). Otherwise it would be managed according to the EETG and EPH guidance documents. Those documents make it clear that ecological impacts from EPH-contaminated sediment are evaluated by investigating COPECs such as PAHs that would be derived from petroleum. This has already been done in the ERA and it was shown that they are not causing risks from surficial sediments.

Comment 3:

Ecological Risk Assessment needs to include photos of the perimeter sample locations in the ERA.

Response 3:

Photos will be included in the ERAR as an Appendix.

Comment 4:

Food Chain Modeling Approach, last paragraph (pg. 3 of 11) — The tier system is not a process to reduce risk by running all tiers, when initial tier shows risk. Tier 1 has a limited number of contaminants. Therefore, tier 2 and 3 are recommended when contaminants are not available on the list or with adequate justification for a less conservative scenario. Based on the Department's knowledge of this IAOC, tier 2 will be appropriate; please see comment #5. Please note that the use of tier 2 TRVs will not be applicable to all IAOCs. Depending on the ecological value of the site, tier 1 may be more appropriate. In cases where tier 2 EcoSSLs are available, with adequate justification provided, or not available, tier 3 can be used (EETG, pg. 50-51). The fact that the TRVs are conservative is not an adequate justification for disregarding tier 1. The supplemental TRV discussion letter sent to the Department on October 25th will be addressed in a separate memorandum.

Response 4:

We have participated in multiple conference calls since this comment was written to resolve food chain modeling issues. Many, if not all issues have been discussed and resolved. ExxonMobil has agreed in principle to continue to use the Tier 1 values and justify any cases where we did not think appropriate. To date this has been a very limited number of examples. In addition, we agreed that the Tier 2 values could be applied to the E1 ponds. We also agreed that if Tier 1 or Tier 2 values were not available that Tier 3 values could be used.

Comment 5:

TRV EcoSSLs selected are not the ones recommended by the EPA. The recommended TRV is equal to the highest bounded NOAEL, lower than the lowest bounded LOAEL for reproduction, growth, or survival, and is equal to 1.63 mg lead/kg bw/day. Please recalculate your HQ with the correct TRVs and revise table 5-10.

Response 5:

See response to Comment 4 regarding TRVs. Regarding the lowest bounded LOAEL, the 1.63 mg/kg BW/day number cited was used, but we agreed to perform a thorough check and make any necessary corrections.

Comment 6.

The ERA needs to have all ecological risk characterized with one consistent set of TRVs (NOAEL and LOAEL) as lines of evidence, used with the different exposure data summary (maximum, 95 UCL and average). The scenarios are presented from the conservative to the less conservative, in that way the assessor can make an educated decision on the potential risk of exposure. Additional tables were presented with the meeting minutes, all tables need to be updated to address comments #4 and # 5.

Response 6:

Please see Response 4 above; these issues have been resolved in our phone conversations. The food chain models for the IAOC E1 Ponds have been revised to be based on the Tier 2 TRVs, unless otherwise noted and justified.

Comment 7:

Please explain why the food ingestion rates from Wildlife Exposure Factors Handbook (EPA 1993) for the muskrat (pg. 2-341) and great blue heron (pg. 2-8) tables were not used in the calculations, in favor of a regression model. The regression model is to be used when species-specific ingestion rates are not available.

Response 7:

Please see Response 4 above; these issues have been resolved over the phone. As discussed in our February 12, 2020 call, we will use Wildlife Exposure Factors Handbook numbers if available unless a more conservative number is available and appropriate. In some cases, the regression model numbers may be more conservative.

Comment 8:

Please provide a justification for using the Swarth 1988 paper for the Spotted sandpiper home range, being 5 ha, instead of the territory size of 0.25 ha as indicated in the Wildlife Exposure Factor Manual (EPA 1993).

Response 8:

We have provided a detailed response to this question via email, including several source papers. Further discussion is warranted to close out this issue.

Comment 9:

The dose calculations were derived by using dry weight. The EETG Section 6.1.3.1 (pg.42) and Guidance of Developing Ecological Soil Screening Levels (USEPA 2005, pg. 4-18) indicate that body weight is reported in fresh weight. Please recalculate the doses using wet or fresh weight.

Response 9:

This was addressed in our February 12, 2020 call.

Comment 10:

Please provide the Nagy (1987) paper and add to the references section.

Response 10:

A copy of the paper is being provided to the Department, appended to this response. This paper is cited widely in the Wildlife Exposure Factors Handbook and is used for many of the estimates of food ingestion rate, etc.

Comment 11:

There is missing information and/or typos in the document, please revise.

- a. Table 5-12, from Sediment Spotted Sandpiper notes have missing information, Note (c).

Response 11a:

This is a typo and will be fixed.

- b. **Table 5-12**, from Mallard Duck Notes: (b) — The weight conversion from Kg to grams is incorrect; as an example, FIR (all birds) regression equation = $0.648(BW(g))^{0.651} = 0.648 * (520^{0.651}) = 0.038 \text{ kg/DW/day}$. Please revise in all tables that applies.

Response 11b:

This was discussed in the February 12, 2020 call.

- c. **Table 5-9B**, notes #2 states that Farrington Lake, East Brunswick, NJ data were collected in 2014, as part of the Ecological Risk Assessment for the former Raritan Arsenal. The year the data were collected was prior to 2014. Please verify the date.

Response 11c:

This was a typo, the actual date is 2004 not 2014. This will be corrected in the ERAR.

Comment 12:

Page 2 of 11, 2'd paragraph — What is the disposition of EEZ 24d?

Response 12:

EEZ 24d is the subject of the IAOC E1 Terrestrial ERA Data Summary Report provided to BEERA on December 18, 2019.

Clarification of Issues Raised during the October 2nd, 2019 NJDEP Ecological Technical Consultation Meeting comments:

Key Issue #1 and #2:

No additional comments.

Response to Key Issues 1 and 2:

Acknowledged.

Key Issue #3:

Please see Aquatic Ecological Risk Assessment- Data Summary Report comment #1.

Response to Key Issue 3:

Acknowledged.

Key Issue #4:

The letter indicates that a licensed surveyor performed estimates of sediment depth, indicating the thickness is generally two feet or less. Please submit the licensed surveyor qualification and the specialized equipment used to complete this assessment. Please refer to the definition of sediments in EETG, section 4.0 (pg. 18).

Response to Key Issue 4:

Surveying activities were conducted by Keller and Kirkpatrick, Inc., under oversight of William Thomas, P.E., New Jersey licensed surveyor number 30109. As discussed in our December 18, 2020 meeting, the depth of sediment was determined by pushing a survey rod down as far as it would go, measuring the top and bottom of the sediment layer and relating that the surface elevation of the pond.

Additional Comment:

Please confirm all samples consist of sediments and not soils. The aerial photography maps provided show the water level below the sample location. This is common, depending on the time of the year, but the aerial shows vegetation along the perimeter, potentially indicating soil. Please provide sediment coring logs in the ERA, including the description of sediments.

Response:

Although the water level may seasonally fluctuate, the samples collected in the pond were all sediments. The 2018 samples were all collected by petite ponar dredge so coring logs are not available. Sediment data on grain size and total organic content were provided in the data summary report as was a general sediment description in the ponds.

Additional Comment.

The comments on biotic zone and frog habitat need to be incorporated in the IAOC CI ERA, where the frogs have been found. Thank you for providing the information specific to Leopard frogs not burrowing in sediments during hibernation. The letter states, "Unlike the popular misconception, frogs do not bury themselves in the mud over winter months as they cannot tolerate the lower oxygen levels there (Emmer 1997)." The comment was specific to leopard frogs (*Rana pipiens*) and American bull frogs (*Bufo catesbeiana*). To reduce misunderstanding in the ERA report, ETRA recommends the whole paragraph from the Scientific American article to be cited or avoid using article, as it is general interest article, instead use Megyesy (2015) published by New Hampshire Fish and Game. The paraphrased Emmer (1997) is general without the context. The full paragraph is cited below.

Aquatic frogs (such as the leopard frog and American bullfrog) typically hibernate underwater. A common misconception is that they spend the winter the way aquatic turtles do, dug into the mud at the bottom of a pond or stream. In fact, hibernating frogs would suffocate if they dug into the

mud for an extended period of time. A hibernating turtle's metabolism slows down so drastically that it can get by on the mud's meager oxygen supply. Hibernating aquatic frogs, however, must be near oxygen-rich water and spend a good portion of the winter just lying on top of the mud or only partially buried. They may even slowly swim around from time to time."

Response:

Acknowledged.

Additional Comment:

The Use of Tier 1 TRVs in ERAs memoranda dated October 25, 2019 will be addressed by the Department in a separate letter.

Response:

Acknowledged. This document was received and discussed with BEERA.

We appreciate the comments provided. As presented in herein, the responses to the comments did not significantly impact the conclusions of the ERA but we will incorporate responses to your comments and any necessary edits into the Ecological Risk Assessment Report (ERAR).

Thank you for your continued cooperation on this project.

Sincerely,



Maureen Forlenza
ExxonMobil Environmental and Property Solutions

cc:

Gina Ferreira, USEPA via electronic mail
Steve Ferreira, USEPA via electronic mail
Allan Motter, NJDEP via electronic mail
Nicole Kozlowski, NJDEP via electronic mail
Iman Olguin-Lira, NJDEP via electronic mail
Michael Renzulli, LSRP via electronic mail
Deborah LaMond, Phillips 66 via electronic mail
Paul Lucuski, Kleinfelder via electronic mail